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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/683,659	10/09/2003	Benjamin M. Rush	THER.008US1	1810

7590 07/02/2004

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EXAMINER

SOLAK, TIMOTHY P

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/683,659	Applicant(s) RUSH ET AL.	
	Examiner Timothy P. Solak	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>04/29/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to because of the following:

- * Reference characters "116" and "118" in Figure 1A, should be switched (see paragraph 0027, lines 2-3).
- * Reference character "215" in Figure 2A, has been used to designate both a "reservoir" and a "wire".
- * Figure 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see paragraph 0039, lines 6-7).
- * In Figure 7, reference character "712 □" would be clearer if replaced by --712--.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page

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header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:

- Recitation of "displacement cavity 705" in paragraph 0045, last line, would be clearer if written as --displacement cavity 706--.

Appropriate correction is required.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: --Pump Having Shape Memory Alloy Actuator--.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (5,622,482). Lee teaches a pump comprising: a movable member 40 at least partially defining a

fluid cavity 28, the moveable member being movable between a first position (see Figure 2) associated with a first minimum volume of the cavity and a second position (see Figure 3) associated with a second volume of the cavity, the member being cycled between the first position and the second position at least one time (column 2, lines 44-58). Lee further discloses an actuator 50 including a shape memory alloy to drive the movable member via thermally induced phase transitions (column 4, lines 48-50) and a biasing element 44. Lee further teaches an inlet 20 having a check valve 22 and an outlet 24 having a check valve 26; both the inlet and outlet in fluid communication with the cavity. Lee discloses fluid is drawn into the cavity through the inlet by the movable member being move from the first position to the second position (see Figure 3) and fluid is expelled from the cavity through the outlet by the movable member being moved from the second position to the first position (see Figure 4).

Claim 8 is rejected under 35 U.S.C. 102(b) as being anticipated by Karamata (6,085,871). Karamata teaches a fluid delivery system comprising: a movable member 23 at least partially defining a fluid cavity (see "d" in Figure 4b), the cavity having an inlet (not labeled, but clearly seen in Figure 4c as the space between item 23 and item 7) and an outlet 220, the member being movable between a first position (see Figure 4d) associated with a first volume of the cavity and second position (see Figure 4c) associated with a second volume of the cavity, the member capable of being cycled between the first position and the second position at least one time. Karamata further discloses an actuator 24 including a shape memory alloy (column 10, lines 1-5) driving the movable member via thermally induced phase transitions (column 6, lines 6-10), a biasing element 5, a controller 25 and a fluid reservoir 20 coupled to the inlet.

Claims 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (previously mentioned). Lee teaches a method of fluid delivery comprising: providing a movable member 40 to at least partially define a fluid cavity 28, changing the temperature of a shape memory alloy material to move the member from a first position (see Figure 2) associated with a first volume of the cavity to a second position (see Figure 3) associated with a second volume of the cavity in one generally uninterrupted motion; returning the shape memory alloy material generally back to an original temperature, and moving the member from the second position back to the first position and repeating (column 4, line 47 to column 5, line 20).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (previously mentioned). Although Lee teaches most of the limitations of the claims, including a movable member 40 at least partially defining a fluid cavity 28, the moveable member being movable between a first position (see Figure 2) associated with a first minimum volume of the cavity and a second position (see Figure 3) associated with a second volume of the cavity via an actuator and a biasing element, he does not disclose the second volume to be a minimum or fluid drawn into the cavity when the moveable member moves from the second position to the first position. Lee teaches all of the structural limitations of the claims, including an actuator and a

biasing element. It would have required only a basic level of skill in the art of pump fabrication to rearrange the elements to have reversed the operation of the unit. Such a minor modification would not have altered the function of the elements or changed the operation of the unit.

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have made the second volume to be a minimum and to draw fluid into the cavity when the moveable member moves from the second position to the first position, in the pump disclosed by Lee, to have advantageously increased the utility of the unit.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Rogen (4,018,547) teaches a pump using a shape memory actuator.
- Coffee (5,211,371) teaches a shape memory valve actuator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy P. Solak whose telephone number is 703-308-6197. The examiner can normally be reached on Monday through Friday from 10am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on 703-308-0102. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Timothy P. Solak
Examiner
Art Unit 3746
June 28, 2004